

## PHENOLICS-OXIDIZING ENZYMES OF ROOTS OF NON-NATIVE AND NATIVE PLANTS

**Kafkewitz, David & Holzapfel, Claus**

Dept. of Biological Sciences, Rutgers University, Newark, NJ

Phenolic compounds are allelopathic signal molecules exuded by the roots of many plants and detected by the roots of other plants. Invasive plants – plants that often were introduced from far-away regions - may not respond appropriately to these coevolved interspecies signals. Root enzymes that destroy phenolic compounds may be involved in the process of permitting an invasive plant to (a) ignore the signal molecules exuded by plants in the native community and (b) to render such allelopathic compounds ineffective. We screened and assayed roots of a wide range of invasive and native grasses for phenolic oxidase and peroxidase enzymes. An analysis of our assembled grass data base suggests that only members of the genus *Bromus* display elevated levels of phenolics-oxidizing enzymes. Species from that genus are known to be problematic invaders in many parts of North America; there are several non-native *Bromus* species in the Hackensack Meadowlands. Other grass genera, regardless of their life form and tendency to invasion, typically have lower levels of these enzymes. Current research is aiming at identifying the ecological function of elevated enzyme activities. Phenolic degrading enzymes have broad specificity. Phenolase and laccase, enzymes widely distributed in the plant kingdom, have been shown capable of degrading chlorophenols and other xenobiotic phenolics. Phytoremediation of xenobiotic chlorophenolics has been demonstrated. Thus knowledge of which plants in the ecosystem possess these enzymes in their roots should be useful in remediating contaminated sites.